ORIGINAL

ORIGINAL FILE

RECEIVED

JUN - 8 1992

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies	)	**ET Docket No. 92-9**

To: The Commission

COMMENTS
OF THE
AMERICAN PETROLEUM INSTITUTE

Wayne V. Black
Christine M. Gill
Frederick J. Day
Marc Berejka
Rick D. Rhodes
Tamara Y. Davis

Keller and Heckman
1001 G Street, N.W.
Suite 500 West
Washington, D.C. 20001
(202) 434-4100

Dated: June 8, 1992

No. of Copies rec'd 014
List ABCDE

TABLE OF CONTENTS

SUMMARY

API is convinced that the Commission's proposal represents a major allocation policy error which holds grave consequences for the safety of the public and the environment. API is concerned that the Commission's precipitate action will cause thousands of Private Operational-Fixed Microwave Service (OFS) licensees in the frequency bands 1850-1990 MHz and 2110-2150/2160-2200 MHz to be ejected from frequency assignments to provide a home for a nebulous group of "new technologies."

API member companies make extensive use of the targeted Microwave spectrum to provide point-to-point telecommunications which protect the public safety and the environment throughout the nation. Accordingly, API cannot understand the Commission's apparent belief that a new technology allocation must be made immediately from OFS spectrum. The Commission's action is particularly troublesome since the high reliability provided by OFS links has demonstrably served the public interest for many years, and since the Commission has given scant attention or analysis to the potential for the use of other spectrum sites as a home for new technologies. Moreover, API has not seen any showing of pent-up demand for new technologies or

any international developments that compel a hasty allocation of the significant amount of the spectrum resource as is contemplated in this proceeding.

Moreover, API is concerned that the reallocation plan which the Commission proposes will be inadequate to allow the continued safety-oriented operations now conducted in the targeted spectrum. API believes that all existing private microwave use must be grandfathered indefinitely and that the Commission must provide a plan by which flexibility in modification of existing microwave facilities is allowed to continue. By such an approach, the Commission will at least provide for the continued measure of public and environmental safety now afforded by OFS microwave systems. Apparently, the Commission has Personal Communication Services (PCS) in mind as the prime candidate to receive new spectrum in the event of reallocation. Accordingly, since API believes PCS will be an urban phenomenon only, any reallocation should reflect this characteristic and provide for shared spectrum use only in urban locales, with indefinite grandfathering for existing OFS operations outside immediate urban areas.

Additionally, API believes that the Commission's action in this matter which has been "long on speculation and short

on analysis", the agency has tainted the entire new technology proceeding on grounds of administrative law and procedure. Specifically, the Commission's failure to compare the benefits of 2 GHz OFS operations against any identifiable emerging technology services offends the notions of due process and administrative fairness. The Commission's failure in this instance also precludes reasoned decision making by the agency.

Finally, should new technology allocations be inevitable, the Commission must designate a more realistic amount of spectrum than is proposed. 230 MHz is a significant amount of spectrum, and before the Commission reallocates such a large portion of the valuable and finite spectrum resource, it must provide an adequate rationale or, alternatively, allocate a significantly smaller portion of spectrum to new technologies.

BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

RECEIVED
JUN - 8 1992
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of	)	
	)	
Redevelopment of Spectrum to	)	
Encourage Innovation in the	)	**ET Docket No. 92-9**
Use of New Telecommunications	)	
Technologies	)	

To: The Commission

COMMENTS
OF THE
AMERICAN PETROLEUM INSTITUTE

The American Petroleum Institute ("API"), by its attorneys, pursuant to the invitation extended by the Federal Communications Commission ("Commission") in its Notice of Proposed Rule Making (Notice)[1/] in the above-referenced proceeding, respectfully submits the following Comments for consideration by the Commission.

I. PRELIMINARY STATEMENT

1. The American Petroleum Institute is a national trade association representing over 200 companies involved in all aspects of the oil and gas industries, including exploration, production, refining, marketing and pipeline

---

1/ Notice of Proposed Rule Making, 7 FCC Rcd. 1542 (1992).

transportation of petroleum, petroleum products and natural gas. Among its many activities, API acts on behalf of its members as a representative before federal and state regulatory agencies and legislative bodies. The API Telecommunications Committee is one of the standing committees of API's General Committee on Transportation. The committee evaluates and develops responses to state and federal proposals affecting telecommunications facilities employed in the oil and gas industries.

2. The Telecommunications Committee is API's primary committee concerned with telecommunications regulatory matters. It is supported and sustained by licensees that are authorized by the Commission to operate, among other telecommunications facilities, point-to-point microwave systems in the Private Operational-Fixed Microwave Service (OFS). These telecommunications facilities are used to support the search for and production of oil and natural gas. These systems are also utilized to ensure the safe pipeline transmission of natural gas, crude oil and refined petroleum products, and for the processing and refining of these energy sources, as well as for their ultimate delivery to industrial and residential customers. The facilities licensed to API's members are thus essential to the provision of our nation's energy sources.

3. API's members utilize operational-fixed microwave frequencies in the 1-3 GHz range to serve a variety of vital point-to-point telecommunications requirements, including communications between oil and gas exploration and production sites, communications to and within refineries, and to extend circuits to pipeline pump and compressor stations. Use of these frequencies by oil and gas entities has increased in recent years. The frequency allocation issues under consideration in this proceeding are therefore of extreme concern to API's member companies. Accordingly, API appreciates this opportunity to submit the following Comments in response to the subject Notice of Proposed Rule Making.

II. SPECTRUM ISSUES

4. The technical elements of the Commission's proposal are based on conclusions drawn from a study performed by the Commission's Office of Engineering and Technology ("OET").[2/] The OET study focused its analysis on spectrum in the 1-3 GHz range and, within that range,

---

2/ "Creating New Technology Bands for Emerging Telecommunications Technology", FCC/OET TS92-1 (January 1992).

concentrated its analysis on the bands 1850-1990 MHz, 2130-2150 MHz and 2160-2200 MHz. Consequently, the "actual range" of spectrum analyzed by the Commission is insufficient to provide the Agency with the full scope of information necessary to arrive at a reasoned and informed spectrum choice in this proceeding. Accordingly, the technical premises underlying the Commission's choice of target bands for "reserve spectrum" are flawed.

5. The Commission instructed OET to rely on five analytical factors in its study. According to these five factors, set forth in the Commission's Notice, the spectrum identified for emerging technologies should: (1) allow inexpensive and immediate manufacture of mobile equipment, (2) have large "blocks" of channels available, (3) allow easy relocation of incumbent users, (4) be non-government spectrum now under FCC control and (5) integrate efficiently for international development.3/ API is convinced that when a thorough spectrum analysis is made using each of these evaluative factors, it is evident that the proposed reallocation of the bands 1.85-1.99 GHz and 2.11-2.15/2.16-2.20 GHz to new technologies should not take place. As discussed below, there is sufficient spectrum

---

3/ Notice pp. 5-6.

outside the 1-3 GHz range, as well as frequencies within the 1-3 GHz range other than those now targeted for reallocation, which meet the Commission's criteria. More importantly, this alternative spectrum may be made available as a new technology reserve without the negative consequences which the proposed reallocation will create.

A. The Commission's Choice to Limit its Analysis of Candidate Frequency Bands Only to Those Between 1-3 GHz Renders its Proposal Defective.

6. The Commission concedes that its consideration of candidate frequency bands was limited strictly to the 1-3 GHz range because of the belief that: (a) the availability of state-of-the-art technology for mobile equipment limits operations to frequencies under 3 GHz and, (b) the spectrum below 1 GHz does not offer contiguous spectrum availability sufficient to provide a location for new technologies.[4/]

7. The Commission has shown no evidence either through the OET study or the Notice that mobile technology is incapable of using higher frequency ranges. It is well established that several private industry projects are

---

4/ Notice, at paragraphs 12 and 13.

underway which employ mobile operations above 3 GHz. For example, AT&T is working on PCS development in the higher range common carrier bands.5/ Motorola now offers "data PCS" type services which operate in the band 17.7-19.7 GHz. Higher range frequencies are also used by the military to provide elements of their mobile service operations. Additionally, certain of the proposed new technologies which must operate in a "mini-cellular" configuration (i.e., PCS and data-PCS) could experience more efficient frequency re-use capability and better operating potential at higher frequency ranges.6/ Obviously, from a mobile services propagation standpoint there is no "magic" to spectrum in the 1-3 GHz range. Accordingly, it is possible that equipment design for such systems could be made easier by an allocation of spectrum in a higher range than 1-3 GHz. Moreover, for the proposed satellite-oriented services such as LEOs and DAB, such frequencies can provide more than adequate performance.

5/ AT&T Bell Laboratories is currently conducting experimentation to design and develop a new wireless communication service that would operate at 6 GHz. AT&T believes that if it can be successful in this frequency range, the actual range of radio frequencies usable for mobile applications will be increased significantly. See Statement of Dale E. Stone, Director -- Personal Communications Networks -- AT&T before the FCC en banc hearings on PCS (December 5, 1991).

6/ See API Statement in Opposition in RM-7618, pp. 12-16 (April 10, 1991).

8. Further, frequencies below 1 GHz also hold promise for use by emerging technologies. It is an acknowledged fact that for low power transmission in urban environments, as is proposed for PCS and data-PCS, frequencies below 1 GHz provide more desirable propagation characteristics since they penetrate buildings, trees, leaded glass and other obstructions better than do frequencies in the 1-3 GHz range.7/ Frequencies below 1 GHz will also efficiently meet the propagation needs for the other new services proposed.

9. The Commission's cursory dismissal of spectrum below the 1 GHz range due to a lack of sufficient contiguous spectrum availability and/or use for broadcasting exhibits a lack of serious analysis since, for example, two significant blocks of lightly used UHF-TV spectrum in the range 512-608 MHz and 614-806 MHZ could offer an excellent spectrum home for new technologies. API believes that, should the Commission remain persuaded that a large spectrum block must be dedicated solely to new technologies, a frequency analysis of significantly greater scope than that performed to date must be made. Such a study would allow

---

7/ See Statement of Carl Bailey, Chevron Information Technology Company, at FCC en banc hearings on PCS (December 5, 1991).

the Commission to review all pertinent information before reaching a final conclusion in this proceeding. API is troubled that the Commission is unwilling to consider the accommodation of new technologies in frequencies outside the 1-3 GHz range. This approach would seem to be inconsistent with the Commission's legal obligation to consider all relevant factors prior to making a final decision.[8/]

10. Even assuming that, after careful consideration of all frequency possibilities, the Commission had determined that the 1-3 GHz range represented the ideal location for emerging technologies, the Commission's spectrum study would still be flawed. The study did not consider other bands within that 1-3 GHz range to fully evaluate spectrum choices which could provide efficient, cost-effective and less disruptive spectrum choices in which to accommodate new technologies. The Commission seems predetermined to identify the bands 1.85-1.99 GHz, 2.13-2.15 GHz, and 2.16-2.20 GHz as the optimal spectrum home for proposed new technologies. API does not concur with the Commission's choice, since other bands within the 1-3 GHz frequency range could be made available faster, with less cost to incumbent users and new technology proponents (and ultimately to the

---

8/ Citizens to Preserve Overton Park, Inc. v. Volpe, 401 U.S. 402, 91 S. Ct 814, 28 L. Ed 2d 136 (1971).

public), and with no harmful impact on the public health and safety as would be created by disruption of current Private Operational-Fixed Microwave Service (OFS) operations.

11. API strongly urges that the Commission re-examine the 2500-2690 MHz band as a new technologies reserve. The band meets the Commission's requirements that new technology spectrum should be located in the 1-3 GHz range and should be under FCC allocation control. The band is lightly loaded, particularly compared to the bands now targeted for reallocation. While the Commission asserts that a substantial number of applications are pending for use of this band, relatively few have been granted and, accordingly, the band could be cleared more quickly and at a substantially lower cost than could the presently targeted spectrum. FCC records show that approximately 3500 wireless cable systems are now licensed, but only approximately 900 have been constructed. It is unknown precisely how many systems are actually operating, but the Wireless Cable Association indicates that there are only 94 fully constructed and operational wireless cable systems in the entire U.S.[9/] Certainly, review of the Annual Reports filed

---

9/ See Petition for Issuance of Further Rulemaking filed by Utilities Telecommunications Council, ET Docket No. 92-9, p. 13, (May 1, 1992).

at the Commission by wireless cable system operators indicate that a high percentage of the licensed systems are non-operational. For example, Microband Corporation of America (MCA), the largest wireless cable licensee in the nation, reports that only 23% (4 stations) of its 27 total licensed stations have any subscribers at all. Of these four (4) systems MCA reported having actual customers, each had only one separate subscriber. These statistics clearly show that the Commission has ignored a little-used spectrum block. Additionally, the required signal ranges for wireless cable and ITFS systems are generally shorter than those of the longer-distance OFS links now in service. Given the typical service area radii of wireless cable and Instructional Television Fixed Service (ITFS) systems, it would appear that these systems, to the extent affected by reallocation of the band 2500-2690 MHz, could satisfactorily be accommodated in higher range spectrum. Further, even if a migration of wireless cable and ITFS systems to higher frequencies results in slightly lower transmission distance and/or service reliability levels, wireless cable and ITFS services do not need the absolute reliability levels required of OFS operations to protect the public health and safety.

12. Additionally, the Commission has recently determined that significant amounts of ITFS-allocated spectrum remain fallow and that such spectrum might be available for reallocation to wireless cable operations.[10/] Accordingly, if only ten channels allocated to ITFS were cleared, this would provide 60 MHz of spectrum in which to accommodate new technologies without disruption or displacement of any party. Such an approach will better serve the public interest than the proposed reallocation which would disrupt thousands of safety-oriented services. API reasserts its support for innovation and new technology development, but reminds the Commission of the importance of accommodating such new technologies in appropriate portions of the spectrum.

13. Moreover, the Commission has not analyzed the possibility of using 120 MHz from the band 1.99-2.11 GHz as a new spectrum reserve. This band is used for "auxiliary activities" by broadcasters and cable television operators. While such uses may have value, it appears that the Commission has arbitrarily assigned a greater societal value to such uses than to use of frequencies in the 1-3 GHz range by petroleum and natural gas production and pipeline

---

10/ See Second Report and Order, FCC General Docket 90-54, 6 FCC Rcd. 6792 (1991).

companies to protect the public safety and the environment. Moreover, broadcasters increasingly are using satellite systems to provide the electronic news gathering (ENG) capability now provided by the band, while the use of microwave spectrum by petroleum, railroad, public safety and utility interests has increased dramatically in recent years.[11/] Accordingly, the band 1.99-2.11 GHz would seem to provide the Commission with an excellent new technology spectrum reserve option.

14. In addition to the bands discussed above, significant amounts of lightly used government spectrum in the 1-3 GHz range also appear available to provide a new technology spectrum reserve. Congress is considering whether to require reallocation of the 1.71-1.85 GHz federal government band to private use. The Commission should investigate the possibility of using this spectrum as a new technologies reserve or, alternatively, as a home for displaced 2 GHz OFS licensees prior to making its final decision in this proceeding. API asserts that this band would make an excellent home for new technologies. However, should the Commission feel compelled to allocate 2 GHz OFS

11/ See Petition for Issuance of Further Notice of Proposed Rule Making of the Utilities Telecommunications Council, ET Docket No. 92-9 (May 1, 1992).

spectrum for new technologies, the 1.71-1.85 GHz federal government band would be the most desirable relocation spectrum for displaced OFS operators since propagation characteristics of this band closely approximate those of the target spectrum. Additionally, the federal government band at 2200-2290 MHz is lightly used in comparison to the spectrum now proposed for a new technology reserve. Based on the recent release of a National Telecommunications and Information Administration (NTIA) study concerning the use of these federal government bands, API and others have requested suspension of the instant proceeding until the Commission can explore the use of underutilized government spectrum as either a new technology reserve or as replacement spectrum for displaced OFS operators.12/

15. The Commission's Notice points out the Congressional efforts to free federal government spectrum for private use and invites comment on the use of government spectrum as a possible replacement for channels lost to

---

12/ See Motion to Suspend - FCC ET Docket No. 92-9, Filed by Association of American Railroads, Large Public Power Council and the American Petroleum Institute (April 10, 1991). See also Comments of American Petroleum Institute responding to NTIA TR 92-285, filed June 5, 1992 in ET Docket No. 92-9.

fixed service operators.[13/] Nevertheless, the Commission admits that it has not considered federal government spectrum because of "delay and uncertainty" involved in reallocation to the private sector.[14/] However, when the potential impact on the public health and safety and environment are considered, API believes the Commission is compelled to consider utilization of government spectrum before reallocating OFS spectrum to new technology uses.

16. The Commission's preliminary allocation decision is based on inadequate analysis of possible spectrum alternatives. The Commission must perform a thorough spectrum analysis to meet its responsibilities in this proceeding.[15/] API is convinced that careful analysis will persuade the Commission to identify other more suitable spectrum that the band 1850-2200 MHz for deploying new technologies.

13/ Notice, paragraph 27.

14/ Notice, f.11.

15/ API particularly notes that, in allocation proceedings involving possible impact upon the public safety, those safety considerations must be given paramount weight. See ¶ 23, infra.

B. The Commission Does Not Give Sufficient Consideration to the Technical Ramifications of its Proposed Allocation Decision.

17. The Commission has given scant consideration to the impact that the proposed allocation will have on the public health and safety, as well as the environment. Apparently, the Commission believes that the needs of displaced licensees may easily be accommodated by fixed microwave bands above 3 GHz and through fiber optic and satellite technologies.16/

18. The Commission's confidence in the viability of such "spectrum substitutes" is misplaced. Frequencies above the 3 GHz range will not provide the long-haul capabilities that assignments from the targeted spectrum bands offer.17/ Although some of the paths operated in the targeted bands are not long distance, many long paths now operate

---

16/ Notice, ¶ 20.

17/ For example, one recent experiment designed to test the feasibility of replacement of 2 GHz microwave links with 6 GHz spectrum, resulted in a determination that 6 GHz spectrum could not provide an adequate and reliable substitute service even for "shorter range" transmissions, due to environmental interference factors. See Testimony of Robert E. Rainear, Executive Vice President, Engineering and Operations -- South Carolina Public Service Authority/Santee Cooper Power Company, Before the United States Senate Committee on Commerce, Science and Transportation (June 3, 1992).

throughout the country in these bands since they provide optimal long distance, point-to-point transmission characteristics.

19. Because frequencies above 3 GHz do not exhibit those same transmission properties, replacement with higher range frequencies will require operators to implement thousands of additional "relay hops" in order to meet long distance transmission needs. The addition of every such "hop" further compromises the reliability of system communications because the possibility of outages increases dramatically with the imposition of every retransmission point. Further, the "rights of way" which would be necessary to construct the additional "hop" sites are frequently prohibitively expensive. This cost will artificially drive up the price of new technology services to the public since new technology operators will, and should, be responsible for reimbursing OFS operators for OFS system conversion costs. Additionally, due to environmental regulations and/or refusals by property owners to give clearances, such rights of way will, in many cases, be practically impossible to obtain. Of course, the cost of reconfiguring such systems will be high due to required equipment changes; operational expense increases are further compounded because maintenance costs will rise

substantially due to the addition of new equipment and sites.

20. Fiber optic and satellite technologies are also inadequate to provide the reliable long distance service which 2 GHz microwave spectrum now affords fixed users. Fiber optic lines are susceptible to damage. Certainly, during disasters such as earthquakes, fiber optic facilities are vulnerable as was clearly demonstrated during the Loma Prieta earthquake in 1989. During that disaster, microwave facility towers were affected by the movement of the earth, but importantly, maintained their position and continued to provide reliable communications service throughout the incident. Fiber optic facilities, conversely, were subject to breakage and immediate outage. Moreover, in routine situations such as excavation for construction projects, fiber optic cable can be severed, resulting in a complete loss of critical services. While satellite technology may be used to meet some communications needs, it will not be an acceptable substitute service in all cases since time delays inherent in signal relay through satellite systems could compromise Supervisory Control and Data Acquisition (SCADA)

system design.[18] Particularly for systems which provide pipeline leak detection capability, it is difficult to ensure "real time" monitoring and control via satellite systems. "Real time" monitoring and control is imperative, however, to adequately guard against the possibility of harm to the public. In sum, the technologies proposed as alternates to microwave simply cannot provide all the services needed by current OFS users due to problems of capacity, technical feasibility and cost. Moreover, federal regulations mandate reliability and redundancy in the communications systems operated by petroleum and gas pipeline companies.[19] Accordingly, since no combination of the proposed substitute technologies can ensure the reliability that microwave channels provide, API asserts

---

18/ Satellite technology can be effectively utilized in low-earth orbit satellite systems (LEOs). API is a strong supporter of the FCC's efforts to quickly implement both small and large LEOs. Particularly, API filed Comments in Docket No. 91-280 (small LEOs) noting that implementation of LEO satellite operations may be potentially more versatile than VSAT transmissions as a means of controlling pipeline valves. Realistically, however, such LEOs capabilities will not be realized for many years. Even when LEOs do become available, the reliability of such systems would still not be as high as that offered by private microwave transmission systems.

19/ See Letter of George Tenley, Associate Administrator for Pipeline Safety, U.S. Department of Transportation to Ralph Haller, Chief, Private Radio Bureau, Federal Communications Commission, concerning private microwave systems (1990).

that the Commission should allow such systems to continue operation without interference.

21. Moreover, even if fiber optic and satellite technologies could replace 2 GHz microwave spectrum, API is alarmed that reliance on such technology would place the vital monitoring and control systems of petroleum and petroleum pipeline companies in the hands of commercial carriers. Although API member companies rely on common carrier services to meet a substantial portion of their communications requirements, certain communication functions cannot be appropriately or reliably provided by common carriers. On critical circuits, companies rely on internally controlled systems, such as 2 GHz microwave, to ensure higher reliability and rapid restoration capability. In times of outages, for example, quick restoration of service to a petroleum monitoring or gas system might not be a top priority of the petroleum company's common carrier. Further, during disasters, the number of calls placed to the disaster site rises dramatically and the public switched telephone network soon becomes hopelessly jammed with traffic. Therefore, even if public network plant could be restored quickly, the public switched telephone network is, as a practical matter, may simply be unavailable for emergency and public safety communications following